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ABSTRACT

A longitudinal study of mental development during the first 6 years of life was conducted to determine whether different social and biological variables were related to mental development at different ages. A total of 218 children having complete neonatal records of 12 biological variables were studied at 6-month intervals until the children were 2 years of age and at annual intervals until the children were 6 years of age. Biological variables included gestational age, birth weight, and Apgar ratings at 1 and 5 minutes. Social variables such as maternal age and education, paternal age and education, number of siblings, and family position were also recorded. Testing at 6, 12, 18, and 24 months was done on the Cattell Infant Scale of Development, with later testing being performed on the Stanford Binet, Wechsler Preschool and Primary Scale of Intelligence, and Wechsler Children's Scales. Mean developmental quotient (DQ) and intelligence quotient (IQ) scores were correlated over time; tests for significance of differences in mean DQ and IQ over time were also computed. Correlations of each biological and social variable with DQ or IQ were computed at each age level. Also computed at each age level were multiple stepwise regressions, with DQ or IQ as the criterion variable. Results indicated that biological variables were related to mental development in children up to 2 years of age, with social variables becoming more important after the second year. (RH)

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Biological and Social Correlates of Mental Development in Young Children

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Biological and social variables were correlated with mental development in 218 children, at six month to one year intervals, from birth to six years of age. Biological variables were related to mental development in children up to two years of age, with social variables becoming more related after age two.

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SOUTHWESTERN PSYCHOLOGICAL ASSOCIATION
San Antonio, Texas
April, 1983

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Biological and Social Correlates of Developmental Delay in Young Children

Child Development

Biological Psychology

Social Psychology

Problem

This study looked at biological and social correlates of mental development in the age range birth to six years, in a longtudinal study designed to assess whether different social and biological variables may be related to child mental development at different ages.

Method

Two hundred eighteen children for whom complete neonatal records of 12 biological varibles were available, were studied at six month intervals to age two and at annual intervals to age six. Biological variables included gestational age, birth weight, and Apgar ratings at one and five minutes. Social variables, such as maternal age and education, paternal age and education, number of siblings, and family position were also recorded. Testing at 6, 12, 18, and 24 months was done using the Cattell, with subsequent age testing including the Standford Binet, WPPSI, and Wechsler Children's Scales, with the Binet repeated. Mean DQ and IQ scores were correlated over time, and tests for significance of differences in mean DQ and IQ scores over time were also computed. Correlations of each biological and social variable with DQ or IQ were computed at each age level, and multiple stepwise regressions using DQ or IQ as the criterion variable, were computed at each age level.

Results

Correlations among DQ and IQ scores over all age levels reached significance, and there more no differences in DQ or IQ scores over time. More significant correlations were found at ages 6 months, 12 months, and 18 months between biological than between social variables with DQ. After 24 months of age, social variables were more related to IQ than were biological variables. Multiple stepwise regression analyses revealed most DQ variance accounted for in young children with such biological variables as Apgar scores and condition at birth up to 12 months, with hardly any variance accounted for by biological variables after four years of age. After two years of age, social variables such as maternal education accounted for increasing IQ variance.

MEAN DEVELOPMENTAL QUOTIENTS

FOR EACH AGE LEVEL

AGE	N	DQ
6 months	264	91
12 months	224	95
18 months	165	95
24 months	156	90
36 months	123	81
48 months	77	93
60 months	65	88
72 months	44	90

6 MONTH GESTATIONAL AGE

DEVELOPMENTAL QUOTIENT

BIOLOGICAL VARIABLE ENTERED	MULTIPLE R	MULTIPLE F	OVERALL P
Gestational Age At Birth	.64	17.96609	.001
# Days In Hospital	.70		
# Days In Tertiary Center	.73		
Birthweight	.74		
Relative Size	.75		
Delivery	.75		
DEMOGRAPHIC VARIABLE ENTERED			
Mother's Age	.13	.59752	.731
Father's Age	.15		
Mothers Educational Level	.17		
Para (number of live birth)	.19		
Gravida (number of pregnancies)	.20		
Fathers Educational Level	.20		

MULTIPLE REGRESSION WITH

12 MONTHS GESTATIONAL AGE

DEVELOPMENTAL QUOTIENT

BIOLOGICAL VARIABLE ENTERED	MULTIPLE R	MULTIPLE F	OVERALL P
# Days in Hospital	.49	5.28244	.001
Gestational Age	.52		
Relative Size	.52		
# Days In Tertiary Center	.53		
Delivery	.53		
Birth Weight	.53		
DEMOGRAPHIC VARIABLE ENTERED			
Father's Educational Level	.13	.78577	.563
Father's Age	.19		
Gravida	.21		
Para	.21		
Mother's Age	.21		

MULTIPLE REGRESSION WITH

18 MONTH GESTATIONAL AGE

DEVELOPMENTAL QUOTIENT

BIOLOGICAL VARIABLE ENTERED	MULTIPLE R	MULTIPLE F	OVERALL P
# Days In Hospital	.41	3.42271	.009
Gestational Age	.42		
Relative Size	.47		
Delivery	.48		
Birth Weight	.48		
DEMOGRAPHIC VARIABLE ENTERED			
Mother's Age	.21	.74138	.619
Para	.24		
Father's Age	.25		
Gravida	.26		
Mothers Educational Level	.27		
Fathers Educational Level	.27		

MULTIPLE REGRESSION

WITH 24 MONTH GESTATIONAL

AGE DEVELOPMENTAL QUOTIENT

BIOLOGICAL VARIABLE ENTERED	MULTIPLE R	MULTIPLE F	OVERALL P
# Days In Hospital	.36	2.10222	.075
Birthweight	.37		
Relative Size	.39		
Delivery	.40		
Gestational Age At Birth	.40		
DEMOGRAPHIC VARIABLE ENTERED			
Father's Educational Level	.19	.72510	.631
Father's Age	.24		
Para	.26		
Garvida (number of pregnancies)	.27		
Mother's Educational Level	.27		
Mother's Age	.27		

MULTIPLE REGRESSION WITH

36 MONTHS GESTATIONAL AGE

DEVELOPMENTAL QUOTIENT

BIOLOGICAL VARIABLE ENTERED	MULTIPLE R	MULTIPLE F	OVERALL P
# Days In Hospital	.33	1.89354	.102
# Days In Tertiary Center	.37		
Birthweight	.41		
Gestational Age At Birth	.44		
Relative Size	.45		
Delivery	.45		
DEMOGRAPHIC VARIABLE ENTERED			
Mother's Age	.38	2.70050	.032
Father's Age	.43		
Father's Educational Level	.47		
Gravida (number of pregnancies)	.47		
Mother's Educational Level	.48		

MULTIPLE REGRESSION WITH

48 MONTHS GESTATIONAL AGE

DEVELOPMENTAL QUOTIENT

BIOLOGICAL VARIABLE ENTERED	MULTIPLE R	MULTPLE F	OVERALL P
Birthweight	.16	.52929	.781
Gestational Age At Birth	.25		
# Days In Hospital	.27		
# Days In Tertiary Center	.33		
Delivery	.33		
Relative Size	.33		
DEMOGRAPHIC VARIABLE ENTERED			
Father's Educational Level	.59	4.02769	.006
Mother's Age	.63		
Mother's Educational Level	.66		
Father's Age	.67		
Gravida (number of pregnancies)	.67		
Para	.69		

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MULTIPLE REGRESSION WITH

60 MONTH GESTATIONAL AGE

DEVELOPMENTAL QUOTIENT

BIOLOGICAL VARIABLE ENTERED	MULTIPLE R	MULTIPLE F	OVERALL P
Delivery	.22	.90990	.509
Birthweight	.26		
Gestational Age	.40		
Relative Size	.45		
# Days In Tertiary Center	.46		
# Days In Hospital	.47		
DEMOGRAPHIC VARIABLE ENTERED			
Father's Educational Level	.58	5.09981	.003
Mother's Age	.63		
Para	.67		
Gravida (number of pregnancies)	.78		
Father's Age	.79		
Mother's Educational Level	.79		

MULTIPLE REGRESSION WITH

72 MONTHS GESTATIONAL AGE

DEVELOPMENTAL QUOTIENT

BIOLOGICAL VARIABLE ENTERED	MULTIPLE R	MULTIPLE F	OVERALL P
Gestational Age At Birth	.17	.71789	.646
# Days In Tertiary Center	.28		
# Days In Hospital	.54		
Relative Size	.56		
Birthweight	.57		
Delivery	.57		
DEMOGRAPHIC VARIABLE ENTERED			
Father's Educational Level	.41	1.11165	.413
Mother's Age	.45		
Father's Age	.57		
Mother's Educational Level	.59		
Gravida (number of pregnancies)	.60		